ditions: 'Die eigentliche Volkssprache nun ... ist nur bei der Formung der landschaftlichen Schreibdialekte beteiligt und da auch nur sehr mittelbar; an der weiteren Entwicklung auf schreibsprachlicher Ebene, vor allem dann an den entscheidenden Ausgleichsvorgängen nach 1500 kann sie keinen Anteil mehr haben' (357).

The New High German Schriftsprache in its broadest historical perspective Besch holds to be a compromise between the two major Schreiblandschaften, Bavarian and East Middle German. The contacts between these two, many and of long standing, kept bringing them closer together, until finally, under Luther's influence, a merging of sorts was effected: 'Durch seinen Einfluß wird der Vorgang zunächst forciert und dann allerdings, ehe er zu Ende gekommen ist, für immer fixiert ... Luther macht aus der ursprünglichen Angleichung an den Süden einen echten Sprachausgleich zwischen dem Ostmitteldeutschen und dem "gemeinen Deutsch" ... Unsere Schriftsprache ist so in ihrem Rohgerüst ostmitteldeutsch-südostdeutsch' (362).

Besch concludes his study with the familiar quotation from Luther's Tischreden, part of which reads: 'Ich rede nach der sächsischen canzeley, welcher nachfolgen alle Fürsten und Könige in Deutschland ... darum ists auch die gemeinste deutsche Sprache. Kaiser Maximilian und Kurf. Friedrich ... haben im römischen Reich die deutschen Sprachen also in eine gewisse Sprache gezogen' (363).

I have commented elsewhere on the significance of this quotation, which—as Besch so ably proves—deserves to be taken pretty much at its face value: 'As this well-known quotation from his Tischreden proves, Luther deliberately adopted what he held to be die gemeine teutsche sprach as used by the royal Saxon chancery. And the sometimes niggling objections of contemporary dialectologists notwithstanding, this is what he did, though in later years he modified his language slightly in favor of other—chiefly southern and western—dialects of High German. His statement that the imperial and royal chanceries both used the same kind of written German cannot be accepted without qualification, but ... they had by this time reached a fair degree of uniformity' (John T. Waterman, *A history of the German language* [Seattle, University of Washington Press, 1966], p. 129).

Besch holds that the South contributed to this 'gemeine deutsche sprache' far more than did the East. With this I cannot agree; nor am I persuaded that his findings permit him this conclusion. He does, however, ably and convincingly demonstrate the degree to which the Upper German and East Middle German Landschaftsschreibsprachen had merged by the end of the fifteenth century. And he confirms what some of us have long suspected: Luther knew what he was talking about.

Internal juncture in Swedish. By EVA GÅRDING. (Travaux de L'Institut de Phonétique de Lund, 6.) Pp. 189. Lund: Gleerup, 1967.

Reviewed by ARTHUR S. ABRAMSON, *University of Connecticut*

Linguists have long been intrigued with the notion of juncture, claiming that investment in one or more juncture phonemes can often simplify the phonology

(Trubetzkoy 1935). Some have insisted that one can apply the usual criteria of independent phonemic analysis to isolate juncture phonemes that can be described phonetically (Moulton 1947). Once found, occurrences of juncture are handy in doing analysis (Hockett 1955:59–64). Other linguists find syntactic boundaries on different grounds—usually word boundaries—and look for features of juncture there (Martinet 1956:37, 96–8). In recent years, with the rise of transformational grammar, juncture has been used to help with stress rules (Chomsky et al. 1956), and it has been thought that points in the deep structure of a sentence might well be represented on the surface by features of juncture (Chomsky & Halle 1968:364–71). In all of these approaches to phonology, it is supposed that at least some kinds of boundaries, usually syntactic, are manifested phonetically.

All too often the scholars advancing such claims are not overly concerned about experimental validation; at best, they are not opposed to close investigation of the alleged phenomenon by others, and will even cite the results if they come out right! But such questions are grist for the mill of the experimental phonetician. After all, he is likely to insist on working within a linguistic framework himself, not simply concerning himself with speech behavior as such; and he will raise some questions not typically asked by the ordinary linguist: (1) Can speakers of a language respond differentially to utterances that are said to be minimally distinguished by the feature posited by the phonologist?[1] (2) If such utterances are indeed distinguished perceptually, does acoustic or physiologic analysis reveal anything in the signal or its production that might be carrying the information? (3) Can such features as are found be manipulated experimentally, either in original utterances or in synthetic speech, to show that they furnish sufficient perceptual cues for the phonological distinction in question? The work under review, although its scope is limited to the first two questions, serves the useful function of presenting extensive data on juncture in representative samples of deliberate and more spontaneous speech in Swedish.

Gårding begins with a very helpful historical survey that starts with Sanskrit sandhi and ranges through modern structural linguistics to the concepts of transformational grammar. The survey ends with an acknowledgement of the great influence of Lehiste's work (1960, 1965) and references to earlier fragmentary attempts to look at internal juncture in Swedish. In Chapter I, 'Syllabification and internal juncture', Gårding describes an experiment in which she had twelve Swedish subjects read a randomized list of 128 words aloud and indicate the syllable boundaries. Her purpose was to arrive at a set of general rules that 'seem to govern a native speaker's intuitive ideas about how syllables are divided in Swedish'. The words had at least two syllables and varied as to stress pattern

[1] The first question, of course, might be asked by any phonologist—but seldom is, especially for prosodic features and juncture. I suppose the question need not arise if the feature is merely an analytic device that is not claimed to have any communicative relevance in its own right. For example, although the deep structures of the two meanings of *Flying airplanes can be dangerous* are different, in a context-free environment the listener need not be led to one interpretation or the other by something in the signal; even so, the linguist might find it desirable or necessary to posit junctures at some level of representation.

and intervocalic consonant combinations. Although she gave the subjects considerable phonetic instruction on syllable-boundary possibilities and told them to ignore spelling, Gårding does not seem to have great confidence in her results, and speaks of 'the informal nature of our investigation'. There is indeed something dissatisfying about the experimental procedure, but I find it hard to design something more rigorous. One might suspect that, in spite of the instructions, knowledge of orthography plays a big role in the results. It would be interesting to try the same experiment with illiterate Swedes. Of course one difficulty might be that the experimenter would have to read the words out for the subjects, thus possibly influencing their pronunciation style.[2] This experiment is presented against a background of phonetic theories of the syllable, traditionally a thorny subject. It seems that people have little difficulty in agreeing on the number of syllables in the passage that they hear, even in a foreign language,[3] but that there is much less agreement on placement of boundaries. These reactions of native speakers are used as a basis for syllabification rules. One very general rule, Rule C, provides for 'natural' syllable divisions. That is, Gårding is of the opinion that 'Rule C closely corresponds to the rhythm of Swedish as given by the timing of a succession of syllabic gestures. Deviations from the natural syllabic divisions and syllabic division between two stressed vocalic nuclei are, in general, determined by word boundaries and morpheme boundaries' (32–3). Syllable boundaries not given by Rule C are special in that they break the natural rhythmical pattern and are considered marked; but a natural syllable boundary can also be marked by prolongation and a decrease in intensity or a pause. Internal juncture is defined then as a marked syllable boundary in a phrase.

For the perceptual phases of this study, Gårding uses both meaningful and nonsense sequences. In the 'sense' material, a list of randomized minimal contrasts in a carrier frame was recorded by two Stockholm speakers. Each speaker recorded a slow reading and a fast reading. The contrasts involved not only placement of juncture, but also juncture versus shift to natural syllable boundary. Subjects listened to test tapes made up from the recordings and marked the utterance heard on an answer sheet on which the members of each minimal pair were written side by side. An item heard as intended by the speaker was considered correct. Correct identifications of the sequences range from 0 to 100%. But the tabulated data are not easy to read; to make the proper comparisons, it is necessary to jump from place to place. To provide a sample of Gårding's findings, I have prepared Table 1 by extracting the results of two minimal pairs from her Table 2.2 (51–5) which illustrate the placement of juncture in the sequence /nsl/. I have changed her 'misinterpretation scores' to percent correct. The scores hovering close to 50% indicate random identification of the item as one member or the other of the minimal pair. Very low scores, for example Speaker

[2] A way around this difficulty could be to work with one subject at a time, providing him with an oral definition of each word. The definition would be expanded and ramified until the subject came up with the right word. Of course, this might be a tedious procedure, but it would be a feasible way of working with illiterates.

[3] I have seen this demonstrated by John Lotz with speakers of varied language backgrounds.

2's fast version of item 2, indicate nearly complete identification as the other member of the pair.

To help interpret the scores, Gårding did an auditory comparison of the four utterances of each test item. She says: 'deviations are usually traceable to the phonetic properties of the phonemes around juncture but sometimes also involve stress patterns and grammatical or semantic factors' (38). The detailed analysis that follows is very interesting, but we might wonder at this point whether she considers juncture to be present simply because it SHOULD be there—even if the expected sign of it, e.g. aspiration, is absent and correct identifications are low or random. That is, she nowhere makes it explicit whether she considers juncture to be a grammatical abstraction that sometimes manifests itself physically and sometimes does not. Of course, if she believes that juncture has linguistic status as a theoretical construct, even when not embodied phonetically, it should be interesting in a phonetic investigation such as this to indicate how reliable marked deviation from natural syllabification is as a sign of certain syntactic boundaries. A shortcoming of the book is the lack of a clear discussion of this matter, even though Gårding shows her awareness of such considerations in her historical survey.

Insofar as auditory phonetics can give it, there is some information on the relative weight of each phonetic feature as a cue to juncture, e.g. aspiration vs. retroflexion. Vowels are good juncture markers: after juncture, most of them have glottal stop or a kind of creakiness as onset. Where identification scores are bad, this feature is weak or nonexistent. Gårding finds that juncture in the sequence isolated from its broad semantic context depends on at least three factors: the segmental context (particularly the post-junctural phonemes), the prosodic context, and the rate of speech. Data supporting the importance of the first and third factors are presented in her Table 2.3 (55) and the graphs of Figs. 2.1–2.3 (56–7). In my Table 2 I have displayed the data for the postjunctural phonemes /s/ and /l/ as a supplement to Table 1 of this review. These averages represent identifications that are somewhat better than chance, but not impressively so. Some idea of the ranges of performance represented by these averages is obtained by looking at the data for the subset in Table 1 where only the sequence /nsl/ is considered. Here we see that /+s/ ranges from 32 to 71 %, and /+l/ from 12 to 96 %. These numbers too are averages that must represent still wider distributions of responses. As one examines Gårding's data closely, the impression is inescapable that, at points in Swedish utterances where 'boundary signals' are grammatically useful, the perceptual cues to internal juncture are not very reliable. This, I think, is a very important finding of the study and is to be com-

TEST-ITEM	SEQUENCE	PERCENT CORRECT			
		SPEAKER 1		SPEAKER 2	
		Slow (25 ss)	Fast (28 ss)	Slow (28 ss)	Fast (20 ss)
1. Ann slår	/ án + sló:r/	56	32	44	50
2. Anns lår	/ áns + ló:r/	12	25	29	10
3. Ann slapp	/ án + sláp/	48	46	71	30
4. Anns lapp	/ áns + láp/	88	86	96	65

TABLE 1

Sequence	Percent correct					
	Speaker 1			Speaker 2		
	Slow	Fast	Mean	Slow	Fast	Mean
/+s/	76	68	72	70	67	68.5
/+l/	87	76	81.5	84	70	77

TABLE 2

pared with similar findings for English (O'Connor & Tooley 1964). Gårding does not make much of this finding, but instead seems to be of the opinion that the speaker of Swedish makes active use of junctural phenomena in processing sentences;[4] that is, the listener apparently makes comparisons of parts of sequences with auditory patterns of words in isolation. This is Gårding's hypothesis for identification of juncture. Internal juncture is best identified when post-juncture allophones have special word-initial features. At higher rates of speech a speaker pays less attention to articulation and word boundaries, so internal juncture tends to be replaced by natural syllable boundaries.

Since the ranking of postjunctural phonemes as effective juncture markers may have been affected by considerations of probability of occurrence of words and grammatical constructions, Gårding also does a perceptual analysis of nonsense sequences. These show a downward trend in the effectiveness of segmental phonemes as juncture markers. In nonsense material, as in meaningful material, the listeners appear to try to match stretches with meaningful words; but when the best cues to juncture are absent, they seem to perform some kind of grammatical analysis. They may interpret the stretch according to the construction that is most likely to occur in a given sequence and stress pattern. In rapid speech a speaker can disregard word and morpheme boundaries and conform to natural syllabification rules, since the recognition of juncture plays a small role in the language, as shown in the paucity of pairs in which the sequences are grammatically equivalent. This explains the uncertainty in nonsense material when there is no grammatical and semantic context and the speaker has conformed to natural syllabification rules.

Most of the rest of the book is devoted to an instrumental analysis of acoustic features correlated with internal juncture. Of considerable interest is the articulatory model presented in Chapter 7. Since no physiological observations were made, all inferences on articulation were necessarily derived from acoustic data. The author interprets the contrastive placement of juncture in terms of Öhman's co-articulation model (1966) of V_1CV_2 sequences. Articulation is viewed as a consonant gesture superimposed on an underlying transition from V_1 to V_2. With this model in mind, Gårding advances two hypotheses to account for observed differences between V + CV and VC + V: (1) THE TRANSLATION HYPOTHESIS. The vowel transitions are the same in both syllables, and the difference is in timing. Shapes dependent on C come earlier in $V_1C + V_2$. This hypothesis is not supported by spectrographic measurements of formant transitions and kinesthetic impressions of tongue movement. (2) THE SHWA HYPOTHESIS. The underlying vowel transitions are different. In $V_1 + CV_2$ the transition goes directly from

[4] Does this mean that the speaker is sufficiently aware of juncture to 'listen for' phonetic signs of it, though more often than not he perceives no acoustic manifestations of it?

V_1 to V_2, but in $V_1C + V_2$ it contains intermediate shapes corresponding to a shwa vowel. That is, the speech organs come closer to rest position and stay there longer at the juncture point in $V_1C + V_2$. This hypothesis is not contradicted by spectrograms and kinesthetic sensations.

Whatever the merits of Öhman's original model, it does not seem to me that Gårding's shwa hypothesis, nor for that matter the 'extended shwa hypothesis' presented later, is convincing. Possibly it would be if she made clearer use of her data. Let me hasten to add that Gårding herself makes no strong claims here, but simply says that 'the complete hypothesis should be looked upon as a possible guide to further experimentation' (133).

The final chapters are devoted to sequences with an intervocalic consonant cluster and juncture in running speech. A serious lack is a concluding chapter that pulls everything together for the reader. The outline of the study provided in the introduction is helpful, but does not replace a conclusion. What questions were raised by the author? What are the answers and what degree of confidence may we place in them? What is the phonological status of internal juncture in Swedish? Whatever role it may have in, say, a generative phonology, is it to be taken seriously as a communicatively relevant feature? As to the last question, I am very dubious.

The book is attractively printed, and the editing, at least in its mechanical aspects, seems good. It suffers, however, from what I understand to be the general Swedish practice of publishing all doctoral dissertations without revisions. Surely a work that can stand on its own merits at a university, as a demonstration of the candidate's ability to do research and organize the results when judged by close advisers, is not necessarily ready to go to the public without some revising. In this instance some reworking of the data and reorganizing of the presentation would ease the reader's task of assimilating Gårding's very diligent research. It is true that this rather detailed treatment is made more readable by a copious supply of numerical tables and figures, including spectrograms, diagrams, and graphs. Some of these, particularly the tables, could have been laid out a little more clearly.

In spite of such shortcomings as I have indicated, this study should not be neglected by students of Swedish linguistics and experimental phonetics. I have found it useful as a reference for students.

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Reviewed by ROBERT D. KING, *University of Texas*

This volume continues the research initiated by Kučera into quantitative aspects of phonology. The major theoretical proposals involved in this research were presented in earlier articles, so that a reader acquainted with Kučera 1963, 1964 will not find much new theoretical material here. He will find phonemic analyses for Czech, German, and Russian, and quantitative calculations of various kinds for the languages singly and in combination: frequency, entropy and redundancy, Kučera's Isotopy Index, and other indices. The extension of the work to German is new, and the discussion—especially of the syllable—considerably expanded over earlier presentations. The book summarizes what has been done over the last decade by Kučera, and latterly by Monroe, in the area of quantitative phonology; indices omitted here, like the functional load computations in Kučera 1963, can be found in the articles cited in their bibliography.

The authors state in Chapter 1 that their work in quantitative phonology has been motivated by an interest in phonological typology and in developing new methods for historical linguistics. It seems to me that their claim to higher relevance is in place, for it is not self-evident that calculation of quantitative indices has any direct relation to linguistics in its deeper sense as a branch of the study of the mind. There are many good reasons why linguistics is not and never has been a quantitative science in the sense that certain branches of the natural sciences are. However, especially since the computer has become easily accessible and its accomplishments in many areas impressive, it has been appealing to try to invigorate and bring numerical 'objectivity' to traditional fields like typology, genetic relationship, and, in general, historical linguistics by infusing them with quantitative techniques. These efforts have not been successful by normal standards: they have not been followed up or used by large numbers of linguists; typically they have ended in obscurity. Why this has been so is one point of my review, but I will defer discussion of these matters, as well as of what I think might be the proper role of quantitative methods. For the present I will summarize what the authors actually do, which is to develop an arsenal of quantita-